

POSTGRADUATE SEMINAR SERIES

Research Findings Seminar

Topic Title : **Game-Theoretic Analysis of Financing Problems In Online Operations**

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Abstract : Online financial services by banks in collaboration with online platforms can help convert the actual transaction data of small- and medium-sized firms into E-commerce credit, which provides novel solutions for the loan problems of those firms. We consider an online system involving a bank, a platform, and a retailer who serves price-sensitive customers on the platform. The retailer receives a loan from the bank and pays a loan interest which is shared by the bank and the platform according to their negotiated allocation ratio. We investigate the system to find optimal decisions and profit levels for the three parties in different scenarios classified into two categories.

In the first category, the platform imposes a commission fee on the retailer, who subsequently makes a retail pricing decision. We analyze four different scenarios in accordance with (i) whether the interest rate and commission fee rate are determined simultaneously or sequentially and (ii) whether the platform independently makes the commission fee rate decision or bargains over the rate with the retailer. We find that the platform can benefit most from partnering with a relatively small bank, whereas the bank can gain the highest profit from cooperating with a platform with similar market power. The retailer can enjoy the highest profit when the bank and the platform have identical power. Moreover, the retailer's and the bank's profits are highest if the bank and the platform play the simultaneous-move game in which the platform and the retailer negotiate the commission fee rate. Although an increase in the platform's referral fee rate decreases the retail price, the interest rate, and the interest allocation to the platform, it can raise the platform's and the bank's profits.

Within the second category, we follow the common practice of bargaining over the interest allocation ratio between the bank and the platform in the first stage as a precondition for cooperation. We also examine the scenarios wherein the bank determines the interest rate before negotiating interest allocation with the platform. Our comparison analysis reveals a counter-intuitive finding wherein the bank and the platform can achieve greater profitability through interest allocation negotiations following the interest rate determination.

Date : **28 April 2023, Friday**
Time : **10:30 – 11:30 am**
Venue : **SEK106, 1/F, Simon & Eleanor Kwok Building**
Language : **English**



**** All are Welcome ****